

REMARKS

In view of the above amendments and following remarks, reconsideration and further examination are requested.

By the current Amendment, claim 9 has been amended to recite that the addition device is for adding **H₂ and O₂** as a decomposition assist gas to the waste gas leaving the solids treating device. Support for this amendment can be found in Example 1 on pages 6-7 of the original specification, and Example 2 on pages 7-8 of the original specification, for example.

Use of H₂ and O₂ as a decomposition assist gas is significant in that such a gas is more easily supplied to waste gas than is water or steam. In this regard, if water or steam is used as a decomposition assist gas, water should be purified by, for example, passing it through an ion-exchange resin prior to supplying the water or steam to the waste gas. Accordingly, in an apparatus for treating a waste gas by supplying water or steam thereto, a device for purifying water would be installed, which would make the apparatus complicated.

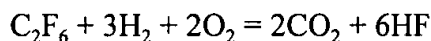
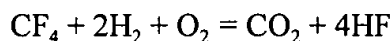
On the other hand, if only a combination of H₂ and O₂ is used as the decomposition assist gas, all that is required for supply of this decomposition assist gas are gas suppliers that are charged with H₂ and O₂, respectively, and can be simply connected to the apparatus. Thus, an apparatus for treating waste gas by supplying a combination of H₂ and O₂ to a waste gas is simpler than a similar apparatus utilizing water or steam.

An apparatus for treating a waste gas including an addition device for adding H₂ and O₂ as a decomposition assist gas to a waste gas leaving a solids treating device, as now required by claim 9, is not taught or suggested by either of the references relied upon by the Examiner. In this regard, each of EP '388 and EP '648 disclose that addition of H₂O is essential for decomposing fluorine-containing components. Use of H₂, or H₂ and O₂, in place of H₂O is neither disclosed nor suggested by either of EP '388 and EP '648. Please see paragraph [0016] in EP '388 and lines 51-54 on page 2 of EP '648, for example.

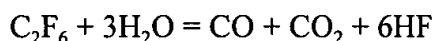
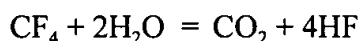
Because each of EP '388 and EP '648 utilize water or steam as a decomposition assist gas, the waste gas treatment apparatus thereof will be complicated due to a device for purifying water being required, as alluded to above. Additionally, because each of EP '388 and EP '648 utilize water or steam as a decomposition assist gas, whereas the instant invention utilizes H₂ and O₂,

decomposition of CF_4 and C_2F_6 , which are typical fluorinated contaminants in a waste gas, is defined by the following reactions.

In the waste gas treatment apparatus of the present invention



In the waste gas treatment apparatus of EP '388 and EP '648



And, as expressed on page 3, lines 37-38 of EP '648, in accordance with the above reactions corresponding to EP '388 and EP '648, CO is generated but can be oxidized to CO_2 by adding oxygen to the reaction. Thus, in addition to steam or water being supplied in EP '388 and EP '648 (which complicates the apparatus thereof by requiring a water purifying device), it is also necessary to supply O_2 , which further complicates the apparatus of EP '388 and EP '648 and makes operation thereof more difficult.

Furthermore, EP '648 teaches away from one skilled in the art using a decomposition assist gas consisting of H_2 and O_2 . In this regard, it is known in the art that combining H_2 and O_2 can result in a potentially explosive condition, and on page 4, lines 52-54 of EP '648 it is expressed that because the decomposition reaction of the fluorine component is with steam, decomposing the fluorine components is highly safe, and danger of explosion, which would be encountered when combustible gas is used, can be eliminated.

Accordingly, because neither EP '388 nor EP '648 disclose or suggest the addition of H_2 and O_2 as a decomposition assist gas, and because one having ordinary skill in the art recognizes that a combination of H_2 and O_2 results in a potentially explosive condition, one having ordinary skill in the art would not have found it obvious to substitute a composition assist gas of H_2 and O_2 for the composition assist gas, i.e. water or steam, of EP '388 and EP '648.

In view of the above, claim 9 is allowable over a combination of EP '388 and EP '648. Thus, claims 9-29 are allowable.

In addition to the above, claim 19 is believed to be patentable in its own right since it recites

a bypass interconnecting said supply line and said discharge line,
said bypass having a bypass valve such that upon actuation of
said bypass valve the waste gas is conveyed from said supply line
to said discharge line without entering said solids treating device.

Because of the inclusion of such a bypass, even if a problem such as an increase in internal pressure or a leak of gases arises in the apparatus such that operation of the apparatus must be stopped, a semiconductor fabrication apparatus such as an etching or CVD apparatus, from which a waste gas is to be treated is discharged, can be continuously operated without stopping production of semiconductor products.

In this regard, the waste gas passed through the bypass can be treated by a scrubber which is installed at a subsequent stage for collectively treating waste gases, if operation of the waste gas treating apparatus is stopped for a short time. If there is no bypass in the waste gas treating apparatus and operation of the apparatus and production of semiconductor products is stopped, then it will take a long time to re-start an operation for the production of semiconductor products. Thus, the bypass as recited in claim 19 can be extremely beneficial during operation of the apparatus, and such a bypass is not taught or suggested by either of EP '388 and EP '648.

In rejecting claim 19, the Examiner has provided an explanation as to why a bypass would have been obvious in EP '388; however, it is respectfully submitted that a *prima facie* case of obviousness has not been established by providing this explanation. In this regard, a *prima facie* case of obviousness cannot be established without proper teachings in the prior art. Accordingly, because none of the references relied upon teach or suggest a bypass, and because the Examiner has provided no other prior art that pertains to a bypass in a waste gas treatment apparatus, it is respectfully submitted that the Examiner has not met his burden in establishing a *prima facie* case of obviousness with regard to claim 19. Thus, claim 19 is patentable in its own right.

Additionally, claim 16 is also believed to be patentable in its own right, since this claim recites **an FT-IR analyzer for monitoring treated gas**. The significance of using an FT-IR analyzer is that such an analyzer is useful for measuring multiple components, especially HF, simultaneously, and can be operated to conduct real-time measurement. Thus, an FT-IR analyzer is more suitable for

monitoring an amount of HF and determining a deactivation degree of a catalyst used in a waste gas treatment apparatus than is a device for performing gas chromatography, which cannot detect HF. An FT-IR analyzer is not taught or suggested by either of EP '388 and EP '648.

In rejecting claim 16, the Examiner took the position that selecting an appropriate type of device to perform analyzing of treated gas is within the purview of one having ordinary skill in the art during routine experimentation. However, without citing prior art pertaining to an FT-IR analyzer in a waste gas treatment apparatus, it is respectfully submitted that the Examiner has not met his burden in establishing a *prima facie* case of obviousness with regard to claim 16. Thus, claim 16 is patentable in its own right.

If after reviewing this Amendment, the Examiner believes that any issues remain which must be resolved before the application can be passed to issue, the Examiner is invited to contact the Applicants' undersigned representative by telephone to resolve such issues.

Respectfully submitted,

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